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Response Under 37 CFR 1.116  
Expedited Procedure  
Examining Group: 2827

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THE UNITED STATES PATENT AND TRADEMARK OFFICE

**RESPONSE TO FINAL REJECTION OF AUGUST 26, 2004**

APPLICANT:	Heismann et al	GROUP ART UNIT: 2827
SERIAL NO.:	10/085,302	EXAMINER: T. Dinh
FILED:	February 28, 2002	CONFIRMATION NO.: 7544
INVENTION:	"PRINTED CIRCUIT BOARD ARRANGEMENT"	

**Mail Stop AF**

Commissioner for Patents  
PO Box 1450  
Alexandria, Virginia 22313-1450

S I R:

In response to the **Final Rejection** dated August 26, 2004, applicants are maintaining claims 2-16 in the application and a reconsideration of the rejection of claims 2, 4-6, 12-14 and 16 and the withdrawal of claims 3, 7-11 and 15 is requested for the following reasons.

In the Final Rejection, claims 3, 7-11 and 15 were withdrawn from consideration as being directed to a non-elected species; claims 2, 4, 13, 14 and 16 were rejected under 35 USC 102(e) as being anticipated by Cohn et al (U.S. Patent No. 6,465,882); claim 5 was rejected under 35 USC 103 as being unpatentable over Cohn et al in view of Haas (U.S. Patent No. 5,121,297) and claims 6 and 12 were rejected under 35 USC 103 as being unpatentable over Cohn et al in view of Marcovici et al (U.S. Patent No. 6,292,529).

Applicants' attorneys wish to thank the Examiner for the courtesy of granting a telephone interview on November 17, 2004, during which proposed changes to claim 16 were discussed and arguments were presented for the allowance of the claims over Cohn et al, with or without the proposed amendments. In view of the Examiner's contention that the proposed amendments would raise new issues, they are not being presented at this time.

Applicants' invention, as shown in Figs. 1, 2 and 3 of the application, has a first fixed portion 1 with a printed circuit board 8 connected by a flexible layer arrangement 2 to a second fixed portion 3. The flexible arrangement, as shown in Figs. 2 and 3 and as

recited in claim 16, has at least one electrically conductive layer, such as the layer 6, with multiple conducting tracks lying next to one another and surrounded by electrical insulating layers, such as 11. The flexible layer arrangement 2, as shown in Fig. 2, is firmly connected in portions to at least one printed circuit board 8 suitable for accommodating a component for forming a first fixed portion. An opening 5 passes through the printed circuit board and extends as far as the conductor tracks in the region of the fixed portion to enable contacting the conductor tracks with a component which is mounted on the printed circuit board. As illustrated, these connections are made by wires 12. The component 4 is preferably a detector module for an x-ray computer tomograph and a plastic casting material, such as 13, can fill the opening 5 after the connections have been formed.

Cohn et al, which is used in rejecting the claims under 35 USC 102 or is the primary reference in the combination rejections under 35 USC 103, as shown in Figs. 5, 6 and 7, has a chip 75 resting on a layer 46, which is on a substrate having insulating layers 20, 22 and 24 and conductive layers 30, 32, 34 and 36, which may be patterned to form interconnections from the top 12 to a bottom 14 of the substrate. A cavity 50, as shown in Figs. 5 and 6, is formed through the top layer 46 plus a conducting layer 32 and the layer 22 and is stepped so as to expose portions of both the layer 32 and 30. This cavity 50 provides exposed portions, such as 30a, 30b, 32a and 32b. As shown in Fig. 7, this cavity has the shape of a four-sided figure, which encloses or surrounds the portion 46 supporting the chip 75, so that the conductor tracks, such as 30a, 30b, 32a and 32b, surround the chip. As illustrated in Fig. 6, after the bonding wires 80 have been connected, the cavity can be encapsulated with a material, such as an epoxy (see column 3, lines 50-55).

In the rejection, the Examiner has marked up Figs. 5 and 6 of Cohn et al and contends that a portion identified as 300 is one fixed portion, while the portion (layers 46, 32 and 22) identified as 200 is the circuit board and the flexible layer 100 is the remaining portion comprising the metal layers 30, 34, 36 plus the insulating layers 20 and 24. Having reviewed the reference, it is respectfully submitted that the Examiner is disregarding the fact that the cavity 50 completely surrounds the portion of the layer 22 that supports the chip 75. Since this cavity has substantially a circular or closed configuration, it is respectfully submitted that the portion under the cavity 50 would not be a flexible portion, such as recited in applicants' claims. It is also noted that the reference is completely silent about any

movable flexible layer arrangement. In addition, it is noted that the reference does not make any distinction between the structure of the layers, such as 20, 22 and 24 and, thus, if the layer 22 or a portion thereof is considered to be a printed circuit board and, thus, is rigid, it is submitted that the layers, such as 20 and 24, would also be rigid and not a movable flexible arrangement. In other words, it is submitted that the Examiner, by designating the portions under the cavity 50 as the movable flexible arrangement portion, is interpreting the teachings of the reference in a manner which would not be obvious to a person of ordinary skill in the art. It is also noted that claim 16, as finally rejected, requires an opening passing through the printed circuit board and extending as far as the conductor tracks being in the region of the fixed portion. The Examiner's interpretation of Cohn et al has the cavity 50 forming the movable flexible layer arrangement and, thus, cannot be both the opening through the printed circuit board and an uncovered portion of the flexible layer arrangement. Finally, it is noted that, as mentioned by the Examiner, the cavity is filled with an encapsulating material, which would render it non-flexible. Thus, it is submitted that the rejection of claim 16 and dependent claims 2, 4, 13 and 14 is based solely on a hindsight interpretation of the teachings of Cohn et al and not the teachings that would be apparent to a person of ordinary skill in the art having only the teachings of Cohn et al without the benefit of applicants' disclosure. For these reasons, it is respectfully submitted that the rejection of claims 2, 4, 13, 14 and 16 is in error and should be withdrawn. It is also submitted that the subject matter of claims 2, 4, 13, 14 and 16 would not be obvious to a person of ordinary skill in the art in view of Cohn et al without relying on applicants' disclosure to make the necessary substitutions, interpretations and modifications. For these reasons, it is respectfully submitted that claims 2, 4, 13, 14 and 16 are allowable over the art of record.

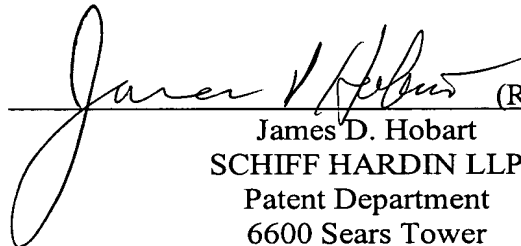
With regard to the rejection of claim 5, it is respectfully submitted that while Haas may show a flexible printed circuit between two fixed or rigid pieces, there is no teaching or suggestion for combining the teachings of Haas with the teachings of Cohn et al to anticipate the subject matter of claim 5. With regard to the rejection of claims 6 and 12 on the combination of Cohn et al and Marcovici et al, while Marcovici et al shows an x-ray detecting system comprising a detector array including multiple photo diodes, it does not teach or suggest the above-mentioned deficiencies with Cohn et al and, therefore, it is

submitted that claims 6 and 12 are not obvious to a person of ordinary skill in the art and, therefore, this rejection should be withdrawn.

It is noted that claims 3, 7-11 and 15 have been withdrawn as being directed to a non-elected invention, which was made in response to an election of species filed in November 2003. It is submitted that since these claims are dependent upon claim 16 or a claim which, in turn, is dependent on claim 16, and since claim 16 is generic to both species, these claims are allowable along with claim 16.

In view of the above arguments, it is respectfully submitted that claims 2-16 are patentable over the prior art of record and should be allowed.

Respectfully submitted,

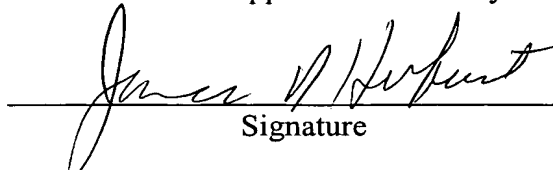
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DATED: November 18, 2004

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on November 18, 2004.

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Name of Applicants' Attorney  
  
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November 18, 2004  
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Date